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ON WHITLOW.

BY

W. MORRANT BAKER.

It may be thought by some that it is impossible to say anything fresh on the subject of such a common disease as whitlow; and it is not unlikely that many, after reading the following brief notes, may feel confirmed in that opinion. At the same time, I venture to believe that this disease is one of those which, from its very frequency, is apt to be treated too often in a routine fashion; the same methods being employed for every variety of it, and, as a consequence, with frequent damage to the usefulness and integrity of the part affected.

The special points to which I wish to draw attention are the following. The usual or routine fashion of diagnosing and treating whitlow; the difficulty which often exists in diagnosing, with any certainty, inflammation with impending or actual suppuration within the tendon-sheath (true thecal whitlow) from cellulitis (including under the latter term, for the present purpose, all forms of erysipelas and phlegmonous erysipelas affecting the tissues of the fingers and hand, but not specially affecting or not affecting at all the sheaths of the tendons); the methods of diagnosis; and the necessity of making such diagnosis, in order that the calamity of injuring the patient by surgical treatment may be avoided.

It will be well, in the first place, to quote what is said on this subject in some of the leading text-books, that one may not be accused of setting up an imaginary position for the sake of assailing it.

The usual opinion regarding whitlow is very clearly given by Mr. Erichsen.[1] "There are four degrees of whitlow. In the first, the inflammation commences in the cutis or immediately beneath it." "In the second degree, the mischief commences deeply in the fibrous

[1] Science and Art of Surgery, 8th edit., vol. ii. p. 928.

fat of the pulp of the finger." "In the third degree, the sheath of the tendon is affected, either primarily or secondarily, by burrowing of pus into it, giving rise to the condition known as thecal abscess." "In the fourth degree, the mischief either commences beneath the periosteum of the ungual phalanx or rapidly extends to it, causing necrosis of the bone. These degrees are occasionally distinct, but more commonly in clinical practice they merge into one another."

With respect to treatment, when milder measures have failed, Mr. Erichsen adds, "A free incision should be made in the palmar aspect of the finger, its length and depth proportionate to the extent of the inflammation." "The incision may be done safely, by making the incision toward the head of a metacarpal bone, upon the bone itself and parallel to its axis, so as to avoid the digital interspaces. The sheath of the flexor tendon should be spared if possible; but if it be affected, it must be freely opened, or the tendon will certainly slough and the finger be permanently stiffened. This incision should be made from the proximal towards the distal end of the finger, so that if the patient involuntarily draw it back, it may meet the knife."

Mr. Timothy Holmes, writing of thecal whitlow,[1] remarks, "An incision is urgently needed, whether suppuration has or has not taken place. The relief to the pain and tension afforded by a free and deep incision in the middle line of the finger is decisive and immediate; and if the incision be made before the abscess has formed, so much the better for the integrity of the part. If, on the other hand, it is delayed, the inflammatory effusion will separate the tendon from the vessels which supply it and cause sloughing of the tendon; or suppuration will penetrate the periosteum, producing necrosis of the phalanx, or may even burrow backwards into the palm of the hand and destroy the whole function of the member."

Speaking of the treatment of inflammation of tendons, Mr. Bryant remarks,[2] "A clean cut should be made as soon as hardness of the parts, with external evidence of inflammation, appears. If pus escape, the practice must be good, but if serum only, the operation will tend to arrest the progress of the affection at its onset, prevent the formation of pus, and probably check the disease. The incision should be vertical over the middle line of the finger, and the centre of the tendon."

Mr. John A. Morgan writes[3] with reference to treatment of all forms of whitlow excepting the cutaneous, "*Early* incision through

[1] A Treatise on Surgery, by T. Holmes, M.A., Cantab, 5th edit., edited by T. Pickering Pick, 1888, p. 526.

[2] Practice of Surgery, 4th edit., vol. ii. p. 317.

[3] Heath's Dict. of Surgery, vol. ii. p. 813.

the affected part, in the middle line and down to the bone, is the only means of allaying pain and of preventing extension of the disease."

In the article in Holmes's "System of Surgery"[1] it is said with regard to treatment, after preliminary measures have failed to give relief, "A free incision must be made along the centre of the finger, and though there may be but very little or no pus in the sheath, yet the division of the tensely strangulated structure, and the escape of blood and serum, afford the greatest relief."

From the above extracts it may be assumed that the usual treatment of cases in which the symptoms point to the presence of pus within the sheath of the flexor tendons is to make a free incision into the sheath along the centre of the finger; and, in cases of doubt as to the actual presence of pus, the same incision should be made, on the assumption that such treatment may prevent its formation. And, in the face of advice coming with such high authority, I am not prepared to say that the practice is always wrong; although I venture to think it may be improved upon, even in cases in which the theca is unquestionably affected. But the fact that a free exposure of the flexor tendons by incision in cases of whitlow will, in most instances, be followed by their sloughing, whether suppuration has actually occurred within their sheath or not, is scarcely, I believe, sufficiently accentuated; and the extreme importance of not incising the sheath, when it is healthy, is not sufficiently recognised. There is, indeed, much truth in Sir William Fergusson's remarks on this matter.[2] Speaking of the free incisions often made in cases of whitlow, he adds, "In some of these cases it may be a question whether the disease or the knife has caused most mischief; but even to admit the latter free of blame, the surgeon and patient too should be prepared for bad consequences when the inflammation has gone so far as to necessitate this practice. I have often, in such cases, seen the sheaths so opened as to permit the tendons to start to the surface of the wound. At first they have appeared quite healthy, but, ere long, sloughing has taken place. Now although sloughing may take place in tendons irrespective of any interference with the sheath, and although sometimes, when tendons are exposed, they do not slough, I have never seen that the surgeon has had much cause for congratulation after such free use of the knife."

The exposure of a tendon in a healthy condition of the surrounding parts, as in the various injuries of the hand with which every surgeon is so familiar, is frequently followed by

[1] J. Lockhart Clarke, re-edited by Arthur E. Barker, vol. ii. p. 175.
[2] A System of Practical Surgery, 5th edit., 1870, p. 199.

complete recovery and restoration of function, and is quite a different matter from its exposure by the knife when all the neighbouring tissues are in a state of inflammation, often of a septic character.

These facts lead naturally to the consideration of the question, "Under what circumstances is it necessary to incise the tendon-sheath?" or, in other words, to the consideration of the extreme importance of any means of diagnosis by which the calamity of incising it unnecessarily may be avoided.

The difficulties in the way of deciding this point—whether, on the one hand, the inflammation essentially affects the theca, originally or by extension, or, on the other, is confined for the most part to the adjacent tissues—are in many cases great. In both groups there is usually a considerable amount of swelling, with acute pain and fever; and it is impossible, in many cases, to detect such limited tension or fluctuation as would indicate the position of the small quantity of retained pus (even if it exist) which may be the chief cause of the patient's distress. To wait until its situation becomes obvious is to leave the patient unrelieved from intolerable pain and, perhaps, until the finger or hand is irreparably damaged. To lay open the sheath of the tendon, when this measure is not required, may, on the other hand, ensure the occurrence of the mischief which we are most anxious to prevent.

Now, I believe we may with care often get a very good notion of which of the two groups of cases we are dealing with. But we must begin by discarding the common idea that cellulitis, at its commencement, has a *special* affection for the tendon-sheaths, and that the latter must be incised to *prevent* their becoming affected. They are often, unfortunately, involved with all the other tissues, when sloughing is extensive, and when relief has not been given early enough to the tense and poisoned tissues; but they are not always involved, at an early period, unless the inflammation begins in them; and if incisions are made freely through the skin and subcutaneous tissue, they may and often do escape. In the case of so-called phlegmonous erysipelas or cellulitis of an arm or leg, the surgeon gives relief by free incisions; but he does not proceed at once to lay open the sheaths of all the muscles and tendons, and thus expose them to the poisonous fluid which is infiltrating the limb. Why should he, in a like case, *begin* by laying open the tendon-sheath of a finger? The answer is to be found, I venture to think, in the fact that it is almost impossible in many cases to tell whether the case is one of cellulitis or of true (primary) thecal whitlow; and that, in the uncertainty, all the cases are treated alike.

The history is sometimes (more frequently, I believe, than is

commonly supposed) a valuable guide both to diagnosis and treatment. When, for example, there is a clear history of a punctured and probably poisoned wound, as in so many of the instances in which surgeons and nurses are the patients, and when the puncture has not reached the tendon or its sheath, we may assume that the latter structures will suffer only by extension of the cellulitis to them, and that this extension may never occur if relief by incision of the superficial parts be given in good time.

I feel afraid to say that there is no *special* affection for the interior of a tendon-sheath on the part of the poison introduced no farther than the skin or subcutaneous tissues,—no more special desire, that is to say, to enter this than other structures, because I know that this is contrary to the belief of many surgeons whose opinions are entitled to the greatest respect. But having carefully watched for this in numerous cases, I can at all events state as a positive fact, that very often indeed the poison does not affect the theca injuriously if the latter be left by the surgeon intact, even in cases in which one or more fingers and the hand, wholly or in part, appear to be involved.

Of course, everything depends on whether the tendon-sheath is or is not affected. If the theca is tightly distended with fluid, it must be opened; although the usual manner of doing this is, I venture to think, not the best. If, however, there is no distension or actually present inflammation of the sheath, the laying it open resembles the laying open of a knee-joint, in the case of inflammation and suppuration around it, in order to prevent it from suffering damage.

It has been just said that it is extremely difficult, in many cases, to decide whether the disease with which we are dealing has already involved the flexor tendons of a finger and their theca. It is, therefore, important to utilise anything that may help in the diagnosis; and I would mention here a symptom to which, so far as I know, attention has not been drawn, but which is often of much value. I refer to the power, or the loss of it, on the part of the patient, of flexing voluntarily the *distal* phalanx of the affected finger. In the case of true thecal whitlow, the movement of the tendons is, at an early stage of the disease, usually restrained or abolished, either from the instinctive restraint of muscular contraction on account of the pain caused thereby (as the movement of the chest-wall may be restrained in pleurisy), or because the normally polished surfaces of the tendon and its sheath have become roughened or partially adherent.

The manner of testing this point is important; and, without a little care, the observer may be misled. In a normal condition of the hand and fingers, it will be noticed that the *terminal* phalanx cannot be voluntarily bent, until the *second* phalanx has been to

some extent bent also, unless the second phalanx is by some means fixed and a *point d'appui* is thus provided for the action of the profundus tendon; and it is scarcely necessary to add that in an inflamed condition of the finger, such as we have in whitlow, the power of bending the terminal phalanx is still further restricted by the swollen condition of the soft tissues, quite apart from any abnormal condition of the tendons or their sheath. In order, therefore, to estimate the movement of the tendon within its sheath, the second phalanx of the finger affected must be fixed; and this is best done by the surgeon placing his thumb on the front of the second phalanx, and the end of one of his fingers of the same hand on the back of the first. The patient is now asked to bend his finger; and the surgeon will be able easily to recognise both by sight and feeling the range of movement, if any, still possessed by the tendon. If the terminal phalanx remains motionless, the presumption is that by some means the profundus tendon is tethered. But, in many cases, the observer, if he has not tried this test before, will be astonished to find how strongly and effectually the flexor tendons can be made by the patient to act, even when the finger looks hopelessly spoiled; and, under such circumstances, the sheath should not be incised without the strongest assurance of the presence of pus within it.

I have ventured to deal with this symptom, which may seem trifling, in some little detail, because I believe it to be of much importance. It has occurred to me, over and over again, in examining fingers affected with whitlow, and in which all the tissues are too much infiltrated with inflammatory products to enable one to get any idea of the real state of the tendon-sheaths, to fall back on this test of the condition of the tendons, and to find that they are still unaffected. Of course, under such conditions, incisions must be made and freely. But the theca must be carefully avoided, and not aimed at. If the case is one of those sweeping attacks (usually sub-periosteal) in which all the tissues are so injured that ultimately necrosis of bone will occur, all the relief possible will be obtained by free incision down to and through the periosteum, in situations where this can be reached, without free exposure of the tendons. But it is not with such cases as these that I am here dealing. Unfortunately, the tendons will in any case probably perish with the bone, unless the terminal phalanx alone is involved, whether the sheath be opened or not. The cases to which I am desirous of drawing attention are the many in which inflammation, frequently septic, is extending in the tissues, but in which, contrary to all appearances, neither bone nor tendon-sheath is essentially involved.

As my object in this paper is merely to ask for a reconsideration of the surgical dictum that early and free incisions should be

made into the tendon-sheaths in all cases in which they may possibly be affected; and to assert, as a fact, that in very many cases of *supposed thecal* whitlow the disease is not essentially thecal, I do not propose to enter on the whole subject of the treatment of whitlow, true or false. The general principles of surgery must be, here as elsewhere, our best guide. But I would add one remark as to the best place for the application of the knife, when the opening of the theca cannot be avoided; or, in other words, when the case is really one in which pus or other fluid is confined within it.

I have already expressed an opinion that the usual method of incising the theca is not the best. It is true that a free incision along the front of the finger gives the most complete exposure of the inflamed internal surface; and were this the only consideration, it would be above criticism. But, unfortunately, while the immediate effect is good, the ultimate result is very often calamitous; that is to say, the patient recovers with a finger of which the flexor tendons are either hopelessly tethered by adhesions, or in which, from their sloughing, they are absent altogether. Frequently, moreover, there is enough scarring and contraction, or even withering of the finger to be objectionable, apart from the disablement, more or less, arising from its stiff condition. Can these results, even in the case of true thecal whitlow, be avoided? Of course, not always; but I believe that in some cases they can; and that sufficient relief may be given to the tense and suppurating theca by less "heroic" measures than the free incisions commonly recommended. On the whole, I am disposed to think that the incision recommended by Mr. Christopher Heath is the best in most cases of thecal whitlow of a finger. In a lecture published in the *Medical Times and Gazette*, June 18, 1881, Mr. Heath, whom I am glad to claim as an advocate for the exercise of great caution with respect to opening the tendon-sheath at all, writes in reference to true thecal whitlow, "If it is not shortly arrested, incisions will be necessary; and it is here that mistakes are often made. The incisions, whether made along the centre or the sides of the finger, ought *not* to open the theca or sheath of the tendons, for if the sheath is opened in this position the tendons invariably slough, and the patient is left with a stiff finger. For this reason, incisions on each side of the finger are safer than one in the centre, that may unawares let out the tendons, which will look perfectly healthy at the moment, but soon become sodden and softened." Speaking of a case in which matter had formed in the sheath and required evacuation, Mr. Heath adds: "I proceeded to evacuate the matter by making an incision through the palmar fascia, over the head of the metacarpal bone. You will remember that the superficial palmar arch

never comes farther forward than the middle one of the three creases or lines found in the skin of the palm, and that the digital arteries arising from it, in the spaces between the flexor tendons, bifurcate some half-inch from the webs of the fingers. There is plenty of room then for a sufficiently free incision in the centre of any of the fingers below the transverse crease which marks off the finger from the palm, or, as I have said, over the head of the metacarpal bone. Matter flowed as soon as I had introduced my knife through the palmar fascia, and I enlarged my incision towards the wrist upon a director, to the extent of nearly an inch, without seeing anything of the flexor tendons. The result has been that the boy has gone out in a week with a perfectly useful finger, whereas, if I had opened the theca and exposed the tendons, they would now be suppurating, and the finger would certainly become useless."

With this advice of Mr. Heath's I quite agree; and although, when suppuration has actually occurred within the theca, adhesions more or less will probably form, as they will, in a suppurating joint or serous cavity, the ultimate result will be much better, with respect both to the aspect of the finger and its usefulness, than in the case of loss of the tendons, which so commonly follows their free exposure. The conclusions which I venture to deduce from the foregoing observations are the following:—

1. That true thecal whitlow, common as it is, is far less common than is generally believed.

2. That the diagnosis of *thecal* whitlow from other forms of the disease is often most difficult.

3. That an important guide in diagnosing the varieties of whitlow may be obtained by testing the range of movement of the flexor tendons, especially that of the flexor profundus.

4. That with reference to treatment, it is most important that thecal whitlow should be diagnosed from other forms of the disease which most closely imitate it, but in which the tendons and their sheaths are not essentially involved.

5. That the theca should on no account be incised as a prophylactic measure, but only when the surgeon is assured of its being affected.

6. That in all cases of (presumably poisoned) wounds producing whitlow, in which there is reason to believe that the original puncture or other injury did not involve the theca, the latter structure should not be assumed, without good reason, to be affected.

7. That in cases of true thecal whitlow, relief should be given to the distended tendon-sheath by a comparatively small incision into it, over the head of the metacarpal bone or thereabouts, and not by a free incision, exposing the tendons, along the palmar aspect of the finger.